DOCUMENT RESUME

ED 230 264 JC 830 287

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TITLE A Comparison of Traditional and Television Lectures as a Means of Instruction in Biology at a Community College.
PUB DATE 22 Jan 83
NOTE 33p.; Ed.D. Practicum, Nova University.
PUB TYPE Dissertations/Theses - Practicum Papers (043) -- Reports - Research/Technical (143) -- Tests/Evaluation Instruments (160)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Attendance Patterns; *Biology; Community Colleges; *Educational Television; *Grades (Scholastic); *Lecture Method; Questionnaires; *Science Instruction; *Student Interests; Two Year Colleges; Withdrawal (Education)

ABSTRACT

A study was conducted to compare the effectiveness of using the television lecture series "Introducing Biology" to traditional lecture techniques in a college-level Animal Biology course. The interest levels and subject course mastery of three groups of students were compared: (1) a control group who attended two 50-minute lectures per week; (2) an experimental group who viewed and discussed the television tapes during the same class periods; and (3) another experimental group who had separate periods for tape viewing and discussion. All three groups had the same amount of in-class and lab time. Study results showed that students attending the lecture course had higher attendance rates and gave better course recommendations than the television-viewing groups, and that there were no significant differences among the groups in attrition rates or stated interest in biology. The study also indicated that subject matter mastery was not enhanced by the television method. While A and B grades remained relatively constant for all groups, there was a downward shift in C to D grades in the television group with separate discussion sections. The interest level questionnaire is included in the study report. (LL)

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JC 830 287

A COMPARISON OF TRADITIONAL AND TELEVISION LECTURES AS A MEANS OF INSTRUCTION IN BIOLOGY AT A COMMUNITY COLLEGE

by

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College of the Sequoias

A PRACTICUM PRESENTED TO NOVA UNIVERSITY
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF DOCTOR OF EDUCATION

NOVA UNIVERSITY

January 22, 1983

ABSTRACT

A quasi-experimental posttest control group design was used with three groups of Animal Biology students in an attempt to compare the effectiveness of using the television lecture series Introducing Biology instead of traditional lecture techniques. Effectiveness was measured in terms of interest levels in biology at the 0.05 level of significance (X^2) and subject matter mastery (letter grades).

The conditions of the study were as stated below. All groups were assigned the same amount of in-class-time. The Control Group had two 50-minute lectures per week. TV Group I had two 50-minute periods per week; thirty minutes were for viewing the television tapes and 20 minutes were for student questions or comments. TV Group II had two 30-minute periods per week for viewing the tapes and a separate 40-minute question/comments period. All groups attended one 100-minute lab each week.

Significant differences were noted in two of the five areas related to interest in biology. Attendance rates and course recommendations were significantly better for the traditional method of instruction. No significant differences were noted between the groups in terms of attrition rates and stated interest levels.

Subject matter mastery was not found to be greatly enhanced by using the television method. A downward shift in C to D grades occurred in one of the television groups. The number of A and B grades remained relatively constant for all groups.

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INTRODUCTION

The Biology Department at College of the Sequoias offers 15 distinct courses. The offerings include courses in anatomy, botany, ecology, genetics, microbiology, physiology and zoology. In an attempt to reduce the possibility of faculty boredom, several of the courses are periodically rotated among the instructors.

One of the rotated courses of particular interest is Animal Biology. This is a nonscience major course. It is designed to accommodate the transfer students' general education requirement in a laboratory science. The annual enrollment in this course (which has 6 - 8 lecture sections) is 200 - 240 students.

Several members of the biology faculty had expressed the desire to teach all lecture sections of Animal Biology via a television tape series, Introducing Biology (a commercial production from Coast Community College) while retaining the traditional approach in the laboratory sections. Their rationale for using the series was as follows:

1. All students would have the same quality and quantity of information presented.

2. The depth of information would be identical.

3. All students would receive identical course content, including the examples used to illustrate concepts.

4. Instructors would be freed from lectures and would therefore have more time available for personal conferences with students.

5. Due to the highly visual nature of the presentations, the students would enjoy biology more.

6. In addition to the scheduled showings, the tapes would be available to the students through the Audio-visual Center. This would allow students an opportunity to spend as much time as they personally needed in order to master the subject.

7. Students who missed a lecture due to illness, field trips, sports events, ect. could easily make-up lectures through the Audio-visual Center.

8. In the final analysis, the students would be more interested in biology and hence would learn more.

The purpose of this study was to critically test the assumption that the television tape series would provide a more effective way of teaching Animal Biology at the College of the Sequoias. This study was directed specifically at interest levels and subject matter mastery.

STATEMENT OF PROBLEM

For the purpose of this study, two research questions were posed.

1. Upon completion of the course, is there a significant difference in the interest levels in biology between the students who attended the traditional lectures as opposed to those who attended the television series lectures?

2. Is there a significant difference in letter grade achievement between the students who attended the traditional lectures compared to those who attended the television series lectures?

RESEARCH HYPOTHESIS

In order to meet the objective of this study, the following hypotheses were tested:

1. Upon completion of the course, there will be a significant difference in the interest levels in biology between the students who attended the traditional lectures compared to those who attended the television series lectures.

2. There will be a significant difference in letter grade achievement between the students who attended the traditional lectures and those who attended the television series.

BACKGROUND AND SIGNIFICANCE

The literature review was carried out on a two faceted basis. It dealt with both audio-tutorial courses and television courses (telecourses). As will be explained more fully in the procedures section, the course at College of the Sequoias had greater similarity to an audio-tutorial approach than to a telecourse.

The use of audio-visual media for instruction has been met with mixed enthusiasm and even misconceptions. Rakow (1980) points out some of the misconceptions which have clouded educational technology from the beginning. He sets the stage with a quotation:

> By making every classroom and every assembly hall a movie show, one hundred percent attendance will be assured. Why you won't be able to keep boys and girls away from school then. They'll get there ahead of time and scramble for good seats, and they'll stay late, begging to see some of the films over again. I'd like to be a boy again when film teaching becomes universal.
>
> Thomas Edison, 1919

It has been pointed out that many of the early educational theorists (Laine [1938] and Weber [1922] in particular) wholeheartedly embraced Edison's notion. However, they are criticized by Rakow (1980) for their dubious assumptions:

1. Traditional methods of instruction are inherently inadequate (p. 37).

2. Language itself is meaningless while only activities, experiences or reproduced experiences (motion pictures) are meaningful (p. 38).

3. Only sensory experiences (mainly visual) lead to learning (p. 40).

He further warns that these assumptions may still underlie thinking even today.

Telecourses

The first television courses sprang up in the early 1950's. Smith (1982, p. 19) contends that the real impetus for this was the great concern to keep up with Russia's Sputnik. In any event, the "sunrise semesters" with the "talking heads" begin. These were simply taped lectures using regular classroom lecturing techniques. Television was looked upon as a means to alleviate problems with increasing numbers of students, crowded facilities, limited human and financial resources, and the desire to increase the amount of information disseminated. Eventually some of the early advocates contemplated it as becoming an equal or even a superior substitute for traditional teaching methods (Ide, 1974, p. 330, 335).

After more than two decades of use, a certain aura of disappointment and dissatisfaction began to shroud television (Smith, 1982, p. 19; Gordon, 1970, p. 27). This was undoubtedly due to initially overlooking some inherent weakness. People simply neglected to fully understand

its potential and exploit it fully. It was ascribed to be a self-sufficient medium (Ide, 1974, p. 350). And finally, the problem of student motivation was greatly underestimated (Gordon, 1970, p. 92).

A more recent trend has been to view television not as a "substitute" but as an "alternative" (Zigerell, 1982, p. 16; Ide, 1974, p. 351). With this concept in mind, Zigerell (1982) predicts that use of mass media in the years ahead. He notes (p. 16) that:

> Some faculty will always deplore uses of media for instruction, stoutly contending that sitting in front of a TV set is a poor substitute for sitting in their classrooms.

However, Zigerell goes on to cite growing nationwide membership in the Instructional Telecommunication Consortium organized in 1979. Schwartz (1982, p. 30), in describing the Adult Learning Service of the Public Broadcasting Service, also claims there is a national movement to promote telecourses as a partner to on-campus classes. In fact, there is a new trend toward campuses like Rio Salado Community College in Arizona. This is a "non-campus" college which serves 9,226 square miles via telecommunication and other media (Baltzer, 1982, p. 26).

The "talking heads" are no longer. They have given way to more elaborate productions for telecourses, which have become "show biz" (Smith, 1982, p. 19). Meanwhile the world of academia has become somewhat skeptical. In part this may be attributed to their conservative nature as a group (Evans, 1967, p. 16). Also, in the past, good quality products have been in short supply (Schwartz, 1982, p. 30). And finally, it is difficult to draw any firm conclusions regarding the true potential and limitation of telecourses (Ide, 1974, p. 352), which is understandable since there has been a great tendency to conduct research on instructional television as an afterthought (Evans, 1967, p. 36).

Evidence for telecourses does exist. Under favorable circumstances

it has been found to be an efficient tool of learning (Ide, 1974, p. 335). Television seems best suited for use under the following conditions (Gordon, 1970, p. 87):

1. Courses in which teachers welcome help.
2. Subjects where the medium offers special visual advantages.
3. Courses which could otherwise not be taught.

The current recommendations regarding telecourses are that assessment and evaluation must be done at each institution. Even if a telecourse has some negative features, it may still become necessary and/or desirable to acquire it and make necessary adaptations and revisions to meet local needs (Purdy, 1982, p. 22). According to Ide (1974, p. 335),

> The questions worth asking are no longer whether students learn from it, but rather does the situation call for it and how, in the given situation, can it be used effectively?

Audio-tutorial Approaches

While telecourses sprang up to educate the masses, a number of educators turned to the problems of the select few, remediation. In 1961 Postlethwait, at Purdue University, began an audio-tutorial approach as a remedial program in botany. His emphasis was on multiple systems of communication (visual, audio, olfactory and tactile). By using a combination of independent study sessions (self-paced and laboratory oriented), small assembly sessions and large assembly sessions the salient feature of the approach was to make the student an active learner physically as well as mentally. He allowed for the fact that people learn differently with varying rates: reading, listening, manipulation of concrete objects (Cross, 1977, p. 86). Others have since followed the approach of Postlethwait and his associates. Their reasons for utilizing the system varied:

1. To avoid problems with course duplication (Gelinas and Haynes, 1982, p. 25; Gwinn, 1982, p. 27).

2. To allow flexibility in pacing (fast, medium, and slow learners) and prior preparation (Gelinas and Haynes, 1982, p. 25).

3. To offset problems of increased enrollment (Hacket and Holt, 1973, p. 499).

4. To allow students flexibility for working, etc. (Ahl, Hiscoe and Lopushinsky, 1981, p. 235).

Results have also varied. Reports of slight to vast improvement have come from: University of Illinois (Perry and Howe, 1981, p. 104); Wichita State University (Bish, Bowman and Sarachek, 1978, p. 170; Langley and Bowman, 1981, p. 237-238); University of Maine (Gelinas and Haynes, 1982, p. 26); Wisconsin State University (Sparks and Unbehaun, 1971, p. 575-576); Syracuse University (Druger, 1979, p. 164); and Western Michigan University (Hacket and Holt, 1973, p. 499). On the other hand, Grobe and Sturges at the University of North Dakota (1973) reported no significant difference in audio-tutorial and conventional methods for teaching biology. An extensive longitudinal evaluation of student performance is currently being conducted at Michigan State University (Ahl, Hiscoe, and Lopushinsky, 1981, p. 236).

Why positive results? Nothing is documented yet; however, the use of specific instructional objectives may have an impact on producing positive results (Bish, Bowman, and Sarachek, 1978, p. 171; Cross, 1977, p. 52-53).

Sparks and Unbehaun (1971) comment on some of the reasons for contradictory studies about effectiveness. Many problems have been noted with evaluating techniques. Numerous studies have lacked the control versus experimental group format (p. 574). In addition, the

great variability of format, human resources, individual bias and course objectives have also come into play (p. 576). Some programs have become self-paced to greater extents than others, and some even have eliminated regular assembly sessions (Gelinas and Haynes, 1982; Ahl, Hiscoe and Lopushinski, 1981; Bish, Bowman and Saracheck, 1978).

Again it must be emphasized that innovative systems which are ideal for one institution may have only limited application at another. What seems to work in selective universities may have little impact on community college testing.

> What happens when the method is transported to the much more diverse student population of the community colleges, where student motiviation is a serious problem? (Cross, 1977, p. 89)

Any mode of instruction has its own drawbacks. The object, therefore, becomes to utilize the most efficient system available. Since the investigations with telecourses or audio-tutorial systems and traditional techniques have yielded conflicting results, it appeared that the subject remained appropriate for study.

DEFINITION OF TERMS

In order to avoid the possibility of ambiguity, the following working definitions of terms are provided for use in this study.

Television Lectures: This was a professional television tape series, Introducing Biology, consisting of 36 thirty minute units complete with a corresponding textbook, study guide, and a teachers's manual with several sets of exam questions (Smith and Roohk, 1978; Coast Community College District, 1978).

Traditional Lectures: These consisted of 50-minute periods where the instructor would usually lecture. On selected occasions movies

and/or Kodachrome slides were shown. Ten minutes of each lecture session were allowed for student questions.

Attendance: This referred to the physical presence of students in the lecture or television viewing sections. Raw data was gathered using a sign-in sheet at each meeting. Data for students who ultimately withdrew from the course was excluded in the calculations.

Attrition: This meant noncompletion of the course by formal student withdrawal.

Interest Level: This was a highly subjective rating. It referred to: a feeling of curiosity or attentiveness; desire of involvement or concern; a feeling of wanting to know.

Letter Grade: Each student was assigned a letter grade based upon his exam scores. The levels of achievement required were:

A = 90-100%; B = 80-89%; C = 65-79%; D = 50-64%; F = below 50%.

Students: Any male or female registered for Animal Biology at College of the Sequoias, Visalia, California.

LIMITATIONS OF STUDY

The following limitations were acknowledged in this study:

1. Subjects were not randomly assigned. Intact groups were used.

2. It was assumed that the groups would be of similar academic ability and have similar levels of maturity.

3. Interest levels were extremely difficult to quantify.

4. The possibility of the Hawthorne Effect existed (Tuckman, 1972, p. 49). Every effort was made to minimize this.

BASIC ASSUMPTIONS

In this study the primary assumption was that the traditional lectures would cover the same concepts and objectives as the television tapes. The second assumption was that the effect of using different textbooks would be minimal.

PROCEDURES FOR DATA COLLECTION

This study followed a quasi-experimental design using the posttest-only control group format (Campbell and Stanley, 1963, p. 25-26). Three intact groups of Animal Biology students were used. Conditions were as follows:

1. All groups were assigned the same amount of in-class-time per week for an entire semester.

2. The traditional lecture section and the television sections met at regularly scheduled times on campus.

3. The laboratory sections were identical in approach, content, objectives and actual exercises.

4. The same content and course objectives were used in the traditional lecture sections as presented in the television series.

5. Over the course of a semester each group was given five objective exams. Exams were made for each group using a double-stratified random sampling technique to ensure that:

   a. all course objectives were covered equally

   b. an equal number of questions came from the television package question pool as well as from the instructor's question pool.

Reliability of the exams was checked with the Coefficient of Internal Consistency (Isacc and Michael, 1971, p. 87). Content validity of the questions in the television package had been determined by the manufacturer. The instructor's question pool was checked for validity by a peer group method. Each test item was systematically compared with its objective (Tuckman, 1972, p. 332-333) and rated on a scale of 1 - 5 (low-high) by other members of the biology faculty. Any test item with a mean rating of less than 4.0 was replaced with an acceptable item.

6. Interest levels were determined by means of a questionnaire (Appendix A), attendance data and attrition rates. The questionnaire was rated for validity using the peer group method previously described.

MEETINGS ON A WEEKLY BASIS

Control Group

1. Two 50-minute periods of traditional lectures
2. One 100-minute laboratory period

TV Group I

1. Two 50-minute periods: (a) 30 minutes for video tapes
   (b) 20 minutes for student questions or comments
2. One 100-minute laboratory period

TV Group II

1. Two 30-minute period of video tapes
2. One 40-minute period for student questions or comments
3. One 100-minute laboratory period

PROCEDURES FOR TESTING DATA

The first research hypothesis stated on page 3 was tested using Chi-square ($P<0.05$) with the following null hypotheses.

Ho_1: Class attendance is independent of the method of course presentation (traditional lectures vs television lectures).

Ha_1: Class attendance is dependent upon the method of course presentation.

Ho_2: Attrition rates are independent of the method of course presentation (traditional lectures vs television lectures).

Ha_2: Attrition rates are dependent upon the method of course presentation.

Ho_3: There is no significant difference in terms of interest levels in biology prior to taking the class between students in the traditional lectures and those in the television lectures.

Ha_3: There is a significant difference in terms of interest levels in biology prior to taking the class between students in the traditional lectures and those in the television lectures.

Ho_4: Interest levels in biology subsequent to taking the class are independent of the method of course presentation (traditional lectures vs television lectures).

Ha_4: Interest levels in biology subsequent to taking the class are dependent upon the method of course presentation.

Ho_5: Recommendations for taking the class are independent of the method of course presentation (traditional lectures vs television lectures).

Ha_5: Recommendations for taking the class are dependent upon the method of presentation.

The second research hypothesis, also stated on page 3, will be tested with this null hypothesis (Chi-square at $P<0.05$).

Ho_6: Letter grade achievement in the class is independent of the method of course presentation (traditional lectures vs television lectures).

Ha_6: Letter grade achievement in the class is dependent upon the method of course presentation.

RESULTS

Presentation of Results

The following data, pertaining to general interest in biology, can be found in Tables 1 - 5: attendance figures, attrition data, and questionnaire information. Student grade achievement is recorded in Table 6 and Figure 1.

TABLE 1
Class Attendance

Group	Student Hours	
	Present	Absent
Control	1199	127
TV Group I	1234	126
TV Group II	821	607

Note: Calculated $X^2 = 615.3$; X^2 at $P<0.05$ ($df = 2$) = 5.99

The data presented in Table 1 was analyzed in conjunction with Ho_1:

Class attendance is independent of the method of course presentation (traditional lectures vs television lectures).

The X^2 value calculated for the data was higher than the critical value at $P<0.05$; therefore, the null hypothesis was rejected. The alternative hypothesis was acceptable:

Ha_1: Class attendance is dependent upon the method of course presentation.

TABLE 2

Class Attrition

Group	Number of Students	
	Withdrew	Completed
Control	7	39
TV Group I	8	40
TV Group II	11	42

Note: Calculated $X^2 = 0.57$; X^2 at $P<0.05$ (df - 2) = 5.99

Class attrition data, Table 2, was examined in conjunction with Ho_2:

Attrition rates are independent of the method of course presentation (traditional lectures vs television lectures).

The calculated X^2 value did not exceed the critical value at $P<0.05$; therefore, the second null hypothesis was not rejected.

TABLE 3

Interest Levels In Biology
Prior To Taking Class

Group	Number of Students		
	Low	Moderate	High
Control	7	27	5
TV Group I	8	28	4
TV Group II	8	29	5

Note: Calculated X^2 = 0.10; X^2 at $P<0.05$ (df = 4) = 9.48

Data in Table 3 was used to test Ho_3:

There is no significant difference in terms of interest levels in biology prior to taking the class between students in the traditional lectures and those in the television lectures.

The critical X^2 value at $P<0.05$ was not exceeded; hence, the third null hypothesis was not rejected.

TABLE 4

Interest Levels In Biology
Subsequent To Class

Group	Number of Students		
	Low	Moderate	High
Control	5	28	6
TV Group I	8	28	4
TV Group II	12	26	4

Note: Calculated X^2 = 3.58; X^2 at $P<0.05$ (df = 4) = 9.48

The data found in Table 4 was examined in reference to Ho_4:

> Interest levels in biology subsequent to taking the class are independent of the method of course presentation (traditional lectures vs television lectures).

The X^2 value calculated for the data did not exceed the critical X^2 value at $P<0.05$; therefore, this null hypothesis was not rejected.

TABLE 5

Recommendations For Taking Class

Group	Number of Students	
	Yes	No
Control	33	6
TV Group I	30	10
TV Group II	25	17

Note: Calculated $X^2 = 6.62$; X^2 at $P<0.05$ (df = 2) = 5.99

Class recommendation data presented in Table 5 was used to test Ho_5:

> Recommendations for taking the class are independent of the method of course presentation (traditional lectures vs television lectures).

Since the calculated X^2 value was higher than the critical X^2 value at $P<0.05$, the fifth null hypothesis should be rejected. Ha_5 should be accepted:

Recommendations for taking the class are dependent upon the method of presentation.

TABLE 6

Letter Grade Distribution For Student Completing Class

Group	Number of Students			
	A	B	C	D
Control	5	11	22	1
TV Group I	5	11	20	4
TV Group II	4	8	17	13

Note: Calculated $X^2 = 14.02$; X^2 at $P<0.05$ ($df = 6$) = 12.59

Finally, Table 6 contains the data used to test the last null hypothesis, Ho_6:

> Letter grade achievement in the class is independent of the method of course presentation (traditional lectures vs television lectures).

The critical X^2 value was exceeded at the 0.05 level of significance; hence, the final null hypothesis was rejected and the alternative hypothesis was accepted.

Ha_6: Letter grade achievement in the class is dependent upon the method of course presentation.

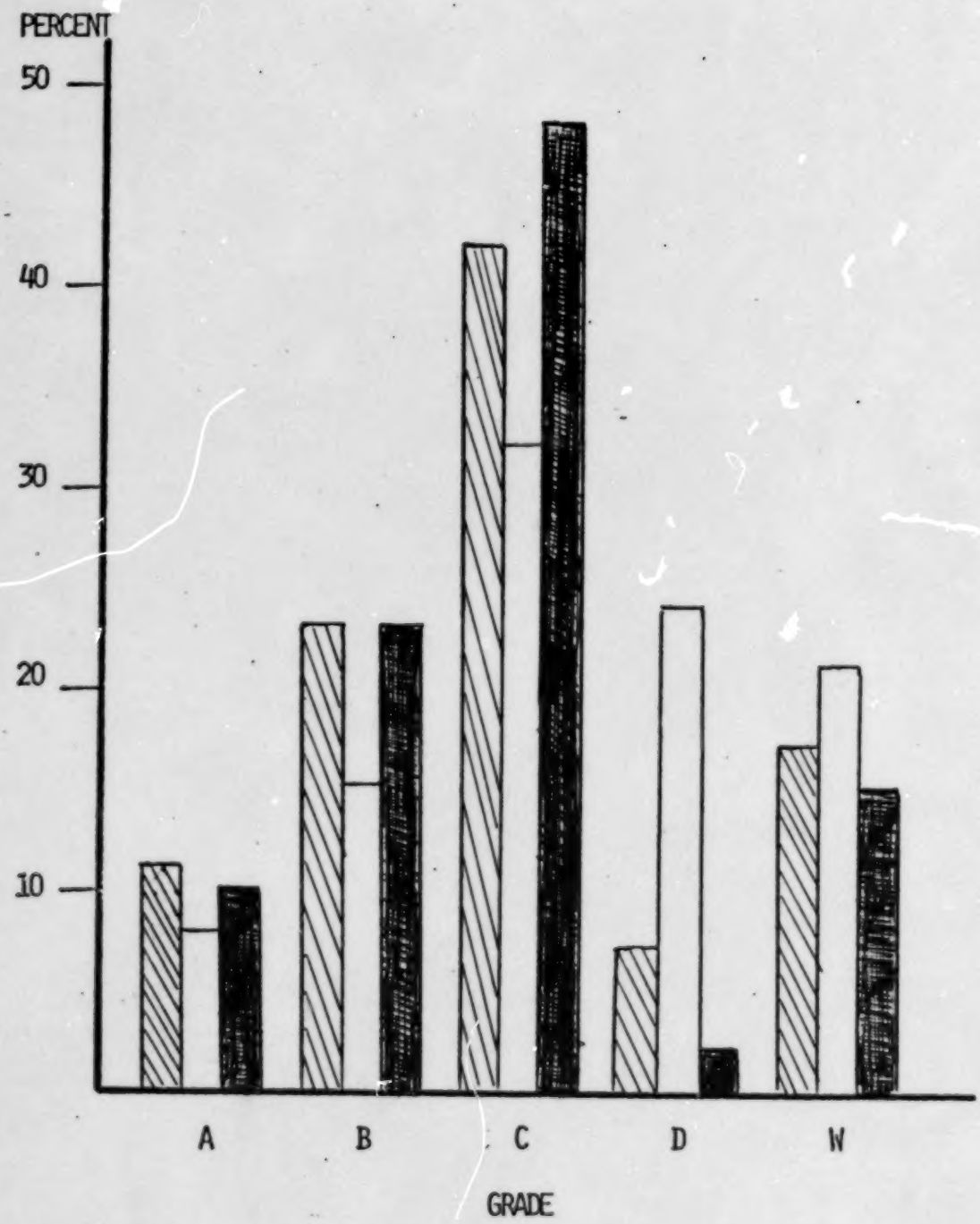

FIGURE 1

Total Grade Distribution

TV Group I (N=48)

TV Group II (N=53)

Control Group (N=46)

Figure 1 is a graphic presentation of data combined from Tables 2 and 6. The grade of W (course withdrawal) includes students who were failing the course as well as those who withdrew for other reasons. This is because the policy at College of the Sequoias is such that a student may withdraw from any course without penalty through the last day of the thirteenth week of the semester.

Interpretation

Two research questions were posed for this study. The first expressed concern over interest levels in biology. Upon completion of the course, is there a significant difference in the interest levels in biology between the students who attended the traditional lectures as opposed to those who attended the television series lectures? As mentioned in the limitations section, interest levels are extremely difficult to quantify.

Two approachs were used in trying to assess interest: (1) tabulate student involvement activities (class attendance and class attrition); (2) ask the student via a questionnaire. Both these approaches were in line with the operational definition used for interest levels (p. 9).

The concept of involvement activities was tied to the idea that if a student is interested in something, he will be more likely to actively participate* in it. The first activity examined was class attendance (Table 1). Class attendance was found to be dependent upon the method of course presentation. Better attendance was noted for the traditional lecture section.

The poorer attendance in the second television lecture section might be indicative of the delay between viewing the tapes and the

*a feeling of curiosity or wanting to know

weekly periods for questions and comments. In a study at Rhode Island College (Keogh, 1970, p. 7) students agreed that an integration session should be scheduled to immediately follow the television lectures. Nonetheless, this does not rule out the notion that students found the traditional lectures more interesting; hence, a better attendance rate followed. Madson (1969) has reported that biology students at the University of Minnesota had better attendance records, seemed more attentive, and more interested in traditional lectures than television lectures.

The second student activity examined was attrition (Table 2). Attrition rates were independent of the method of course presentation. This might indicate similar student interest in all methods of presentation. Or, it might be related to the fact that a large number of students were initially enrolled to fulfill a general education requirement (Hackett and Holt, 1973, p. 511).

The second approach used in trying to assess interest employed a questionnaire. The results from the first two questions were used in an attempt to establish interest levels in biology prior to and subsequent to taking the course. No significant differences were noted (Table 3 and 4). Interest levels in biology did not seem to either increase or decrease with different instructional methods. Woodward (1964, p. 16) obtained similar results at the University of Miami. However, an interesting point can be found in Table 5. Course recommendation was dependent upon the method of presentation; television was not rated as highly as traditional lecture methods.

Course recommendation could also be interpreted as an indication of interest. The assumption being made is that if one is interested in

a course then he is likely to recommend it to others; however, a course which has been found to be uninteresting is usually not recommended. This too is in line with Woodward's observations (1964, p. 13, 15). He reported that a significant number of students in the television lecture section were not as attentive as those in the regular lecture section. Also, the television lectures were rated as being boring even though the content was identical and the same instructor made both presentations.

The data presented in Table 6 pertains to the second research question. Is there a significant difference in letter grade achievement between the students who attended the traditional lectures compared to those who attended the television series lectures? The conclusion drawn was that a significant difference occurred. Conflicting reports, as well as those of agreement, can be found in the literature (Grobee and Sturge, 1973; Perry and Howe, 1981; Hacket and Holt, 1973; Woodward, 1964).

An interesting point was noted when reviewing the data in Table 6 and Figure 1. The difference in letter grade distribution between the traditional and television lecture sections appeared to be restricted to the C and D categories.

Auxiliary Finding

Since a significant difference in attendance data was found (Table 1), the number of hours of nonattendance in the television sections was compared with the number of hours students had checked out tapes from the Audio-visual Center. Records obtained from the Audio-visual Center listed only 14.5 hours of student usage. The conclusion that was drawn was that students did not take advantage of the available tapes to make up missed lectures.

CONCLUSION

In this study significant differences were noted in two of the five areas related to interest in biology. Attendance rates and course recommendations were significantly better for the traditional lecture method of instruction. However, no significant differences were noted between the groups in terms of attrition rates and stated interest levels. Thus, it is concluded that the television method of instruction did not generate the high interest in biology that the faculty has originally anticipated.

Subject matter mastery was not found to be greatly inhanced by using the television method. Significant differences in letter grade distribution were noted. However, it seemed to be a downward shift of C to D grades in one of the television groups. The number of A and B grades remained relatively constant. Hence, it is again noted that the television method did not yield the results that had been anticipated by the faculty. However, additional study is indicated before binding decisions can be made regarding the continued use or abandonment of either method of instruction.

RECOMMENDATIONS

The overall recommendation from this study is that three additional questions need to be critically investigated before any decisions are

made regarding future use of the television method of instruction at College of the Sequoias.

1. Why did significant differences occur in attendance, course recommendation, and grade distribution?
2. What changes could be made to improve attendance or utilization of the Audio-visual center, course recommendation, and grade distribution?
3. Are the techniques necessary to affect the changes feasible at College of the Sequoias?

BIBLIOGRAPHY

Ahl, A. S., H. B. Hiscoe and T. Lopushinsky 1981. Usefulness of student-controlled videotapes in lecture teaching. Journal of College Science Teaching, February: 234-236.

Anastasi, A. 1954. Psychological Testing. New York: MacMillan.

Baltzer, J. 1982. Variety adds effectiveness (and spice). Community and Junior College Journal, 53 (2): 26-27.

Bish, J. T., B. L. Bowman and A. Sarachek 1978. Lecture-laboratory versus structured audio-tutorial approaches: student achievement. Journal of College Science Teaching, January: 168-171.

Campbell, D. T. and J. C. Stanley 1963. Experimental And Quasi-Experimental Designs For Research. Chicago: Rand McNally College Publishing Company.

Coastline Community College 1978. Student Handbook For Introducing Biology. Dubuque, Iowa: Kendall/Hunt Publishing Company.

Cross, K. P. 1977. Accent On Learning. San Francisco: Jossey-Bass Publishing.

Druger, M. 1979. Humanizing the introductory college biology course. Journal of College Science Teaching, January: 164-167.

Evans, R. I. 1967. Resistance To Innovation In Higher Education. San Francisco: Jossey-Bass Inc., Publishing.

Gagne, R. M. 1977. The Conditions of Learning. New York: Holt, Rinehart and Winston.

Gelinas, D and J. Haynes 1982. A self-paced, variable-credit, individualized content biology course. Journal of College Science Teaching, September/October: 25-27.

Gordon, G. N. 1970. Classroom Television. New York: Hastings House, Publishers.

Graham, J. F. and L. S. Perry 1982. Open lab for general chemistry. Journal of College Science Teaching, February: 227-229.

Grolee, C. H. and A. W. Sturges 1973. The audio-tutorial and conventional methods of college-level biology for nonscience majors. Science Education, 57 (1): 65-70.

Gwinn, J. F. 1982. Can you afford not to individualize/computerize? Journal of College Science Teaching, September/October: 27-28.

Hacket, D. and I. V. Holt 1973. Biological science as an audio-tutorial system of instruction for the non-science major. Science Education, 57 (4): 499-516.

Harris, T. M. and M. C. Shaffer 1969. Television in the biology laboratory. Science Teacher, 36 (8) 31-33.

Ide, T. R. 1974. The potentials and limitations of television as an educational medium. In D. R. Olson (ed.) Media And Symbols: The Forms Of Expression, Communication, And Education. Chicago: University of Chicago Press. Pg. 330-356.

Isaac, S. and W. B. Michael 1971. Handbook In Research And Evaluation. San Diego, CA.: Edits Publisher.

Keogh, R.N. 1970. Instructional Television Programming In The Biological Sciences: A Restructured Format. Final Report ED062834

Laine, E. 1938. Motion Pictures and Radio. New York: McGraw-Hill.

Langley, W. M. and B. L. Bowman 1981. Portable audio-tutorial versus lectures in presentation of ecological concepts. Journal of College Science Teaching, February: 236-238.

Madson, M. L. 1969. Methods, Including CCTV, of Presenting Introductory Biology: Their "Affect" On College Freshmen. Minneapolis: Minnesota University.

Mirkin, B. 1982. Vo-tech TV ok. Community and Junior College Journal, 53 (2): 36-37.

Perry, J. L. and C. Z. Howe 1981. Evaluation of a variable-credit, self-paced, introductory-level, college physiology course. Journal of College Science Teaching, November: 101-104.

Postlethwait, S. N., J. Novak, H. T. Murray, Jr. 1969. The Audio-tutorial Approach To Learning. Minneapolis: Burgess Publishing Co.

Purdy, L. 1982. Here's how on-switch turns on students, too. Community and Junior College Journal, 53 (2): 20-23.

Rakow, J. 1980. The audiovisual myth in America: filling cracks of educational technology. Journal of Education, 162 (4): 34-54.

Russock, H. I. 1977. Data collection from videotaped experiments in a biology laboratory. American Biology Teacher, February 39 (2): 93-95, 118.

Sapper, N. 1982. For a graybeard: things change. Community and Junior College Journal, 53 (2): 24-25.

Schwartz, G. 1982. PBS = success? Community and Junior College Journal, 53 (2): 30-31.

Smith, L. M. and B. L. Roohk 1978. Introducing Biology. Dubuque, Iowa: Kendall/Hunt Publishing Company.

Smith, R. W. 1982. If show biz is no biz, what is? Community and Junior College Journal, 53 (2): 19-20.

Sparks, P. D. and L. M. Unbehaun 1971. Achievement of audio-tutorial and conventional biology students a comparative study. Biological Science, 21 (12): 574-576.

Stevenson, J. 1981. Media in the open university: a look towards the 1980's. Teaching At A Distance, 19: 19-23.

Szabo, M. and A. Lamiell-Landy 1981. Television-based reading instruction, reading achievement and task involvement. Journal of Educational Research, 74 (4): 239-44.

Tuchman, B. W. 1972. Conducting Educational Research. New York: Harcourt Brace Jovanovich, Inc.

Weber, J. J. 1922. Relation of experience to learning. Educational Screen, November-December 284-288.

Woodward, J. C. 1964. Attitude And Achievement Comparisons For Direct And Television Classes In Biological Science - Report 3. Miami: Miami University.

Young, R. K. and D. J. Veldman 1981. Introductory Statistics For The Behavioral Sciences. New York: Holt, Rinehart and Winston.

Zigerell, J. 1982. Video vitality: consortium has it. Community and Junior College Journal, 53 (2): 16-18.

Zucker, A. A. 1981. The use of telecommunications in public education during the 1980's. Journal of Educational Technology Systems, 9 (3): 229-39.

APPENDIX A

INTEREST LEVEL QUESTIONNAIRE

Please answer each question as honestly as possible. Circle the item which best expresses how you feel. For the purpose of this questionnaire, the term interest refers to: a feeling of curiosity or attentiveness; desire of involvement or concern; a feeling of wanting to know.

1. Before taking this class my interest in biology was:

   a. not interested
   b. low
   c. moderate
   d. high

2. Since taking this class my interest in biology is:

   a. not interested
   b. low
   c. moderate
   d. high

3. Even if this was not a required class I would recommend it others.

   a. yes
   b. no

Thank you for taking the time to complete this questionnaire

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JUL 15 1983